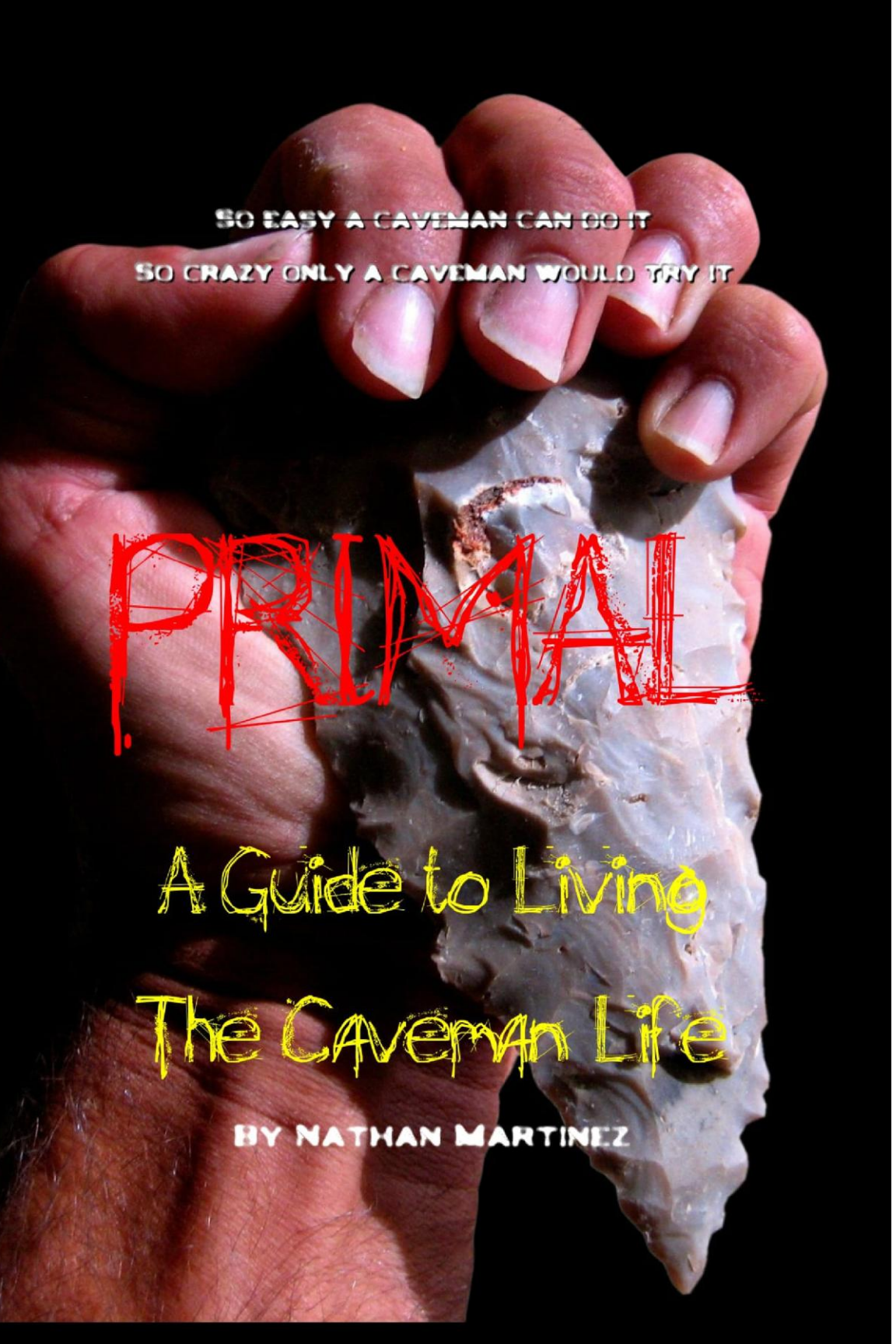
So easy a caveman can do it
So crazy only a caveman would try it
PRIMAL
A Guide to Living
The Caveman Life
By Nathan Martinez

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A Guide to Living the Caveman Life

BY NATHAN MARTINEZ

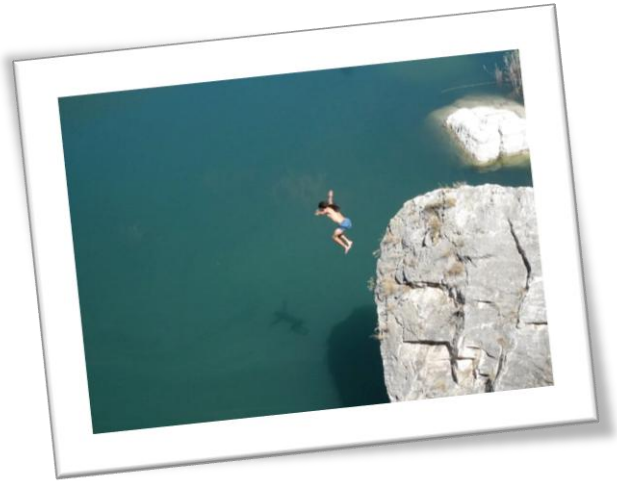
Joie de Vivre, Caveman Style

"Survivalism" and "primitive skills" are all the rage these days. With modern tools and weapons like guns or even bows (and yes, even the most primitive bow is modern as hell) thriving in the wild should be a breeze for anyone who is even remotely good at stalking and using their modern weapons. Shockingly, this is not the case. The majority of people today have become domesticated, in the same manner that wolves were turned into poodles (Theofanopoulou, Gastaldon, & O'Rourke, 2017). They just don't have the stomach for savagery – literally. They can't go days without eating, drink untreated muddy water or hold down raw meat. Recently a pair of Mexican shark fishermen lost power to the engine on their small open boat in a raging storm and were blown out into the Pacific with all their gear, food and water washed overboard. The novice starved to death because he refused to eat raw bird meat. The veteran not only survived but thrived during a record 438 days adrift at sea feasting on raw birds, turtles and sharks, all caught with his bare hands (Franklin, 2015). This guy was a beast, but then again, he was a veteran *tiburonero*, and we commercial shark fisherman are about as crazy as they come.

There are always people who want (and have the innate ability) to go further – *much* further. These wild maniacs somehow avoided domestication and typically hail from long unbroken ancestral lines of explorers, adventurers, warriors, barbarians and thrill seekers who feel most alive in extreme situations. And what could be more extreme than the challenge of entering the world of our most distant ancestors – the Australopithecus, Erectus and Neandertal? These walking apes were the ultimate bad assess. They made simple but razor-sharp knives out of rocks, ran off prides of lions stark naked

and took their kills, thrived on raw meat, survived thousands of years of ice ages without sewn clothing, and without any projectile weapons, took down mammoths in hand-to- tusk combat with sharp wooden sticks. And after all this, they still had enough energy to go hunting for mates and fight off the neighbors. 200,000 years later, the recent discovery of their genes in living human populations (Pääbo, 2015) proves that they didn't just survive – they rocked!

This book is not about survival, so forget the modern axioms of "survival" priorities. THE priority for wild animals is food – greasy, dripping with fat and blood, mouth-watering honey, sugar-soaked stomach-bloating FOOD! If "survival" is your goal in life, it's a pretty pathetic one – guaranteed to fail because one day the Universe will decide it's your time to get eaten and there's not a damn thing you can do about it. If Nature has a goal, it is for us to pass on our genes, and passing on our genes is really, really fun – just like hunting, eating and being free to do whatever the hell you want. If anything, the point of life is probably to stay alive long enough to pass on your genes and have a damn good time while you're doing it!



Tools of the Trade

Humans were once thought to be "unique" for their use of tools, but we now know that many other animals use a plethora of tools and technologies (Shumaker, 2011).

Beavers build canals and dams to transport logs and food to their elaborate lodges, dolphins and whales collaborate to construct massive bubble nets to encircle schools of fish, otters use rocks to bust open abalones, capuchin monkeys use boulders to crack nuts, crows use sticks to get hard-to-reach food, orangutans use leaf umbrellas and log rafts, and chimpanzees take the cake with stone mortars, wooden spears and clubs, woven nests, termite fishing rods and the ability to shoot AK-47's. The best part about caveman tools is that most of them only take a few minutes to make and are all disposable!

One of my bifacial points (flaked on both sides) hafted onto a notched wooden spear shaft with fiber cordage and wax. While bifacial projectile points were associated with the arrival of Homo sapiens, the Neandertals likely attatched "simpler" stone blades to their thrusting spears (Boëda, 1999).

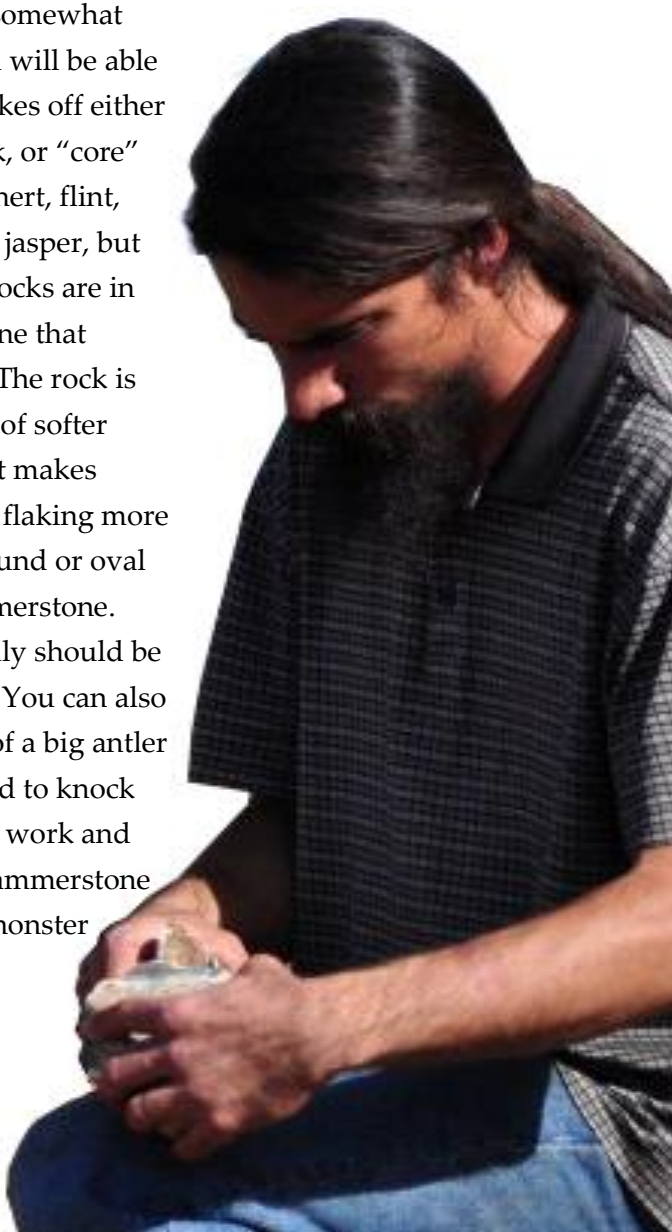
Smashing Rocks

Unlike lions and wolves that are equipped with self-sharpening , serrated carnassial slicer teeth, we have no built-in way to cut through the tough hides and flesh of our prey. However, our ancestor Australopithecus found a simple solution to that problem by breaking rocks to create the sharpest blades ever invented (McPherron & Alemseged, 2010). To try to recreate this discovery, anthropologists secured some food with a string mechanism that had to be cut to obtain the food. They then gave a bonobo (pygmy chimp) some rocks. The chimp's solution was shockingly simple. He threw a rock at his cage floor, instantly shattering it into hundreds of razor blades (Savage-Rumbaugh, 1996). He picked one up, sliced the string and chowed down on that banana with a smirk on his face.

Knapping stone blades is all complicated geometry. The best way to learn is to watch someone and practice, practice, practice. Eventually your brain will be able to calculate all the breaking

angles without you aware of it at all. Our earliest ancestors certainly didn't know anything about formal geometry and probably didn't even have language to explain what they were doing. They probably couldn't even comprehend that the stone broke only at certain angles – it was all mimicking Uncle Grock, trial, error and muscle memory.

To make a simple stone flake, look for a rock that is either somewhat flat or cone shaped (you will be able to knock razor sharp flakes off either shape). Ideally, this rock, or "core" should be glass-like -- chert, flint, obsidian, chalcedony or jasper, but try breaking whatever rocks are in your area till you find one that breaks to a sharp edge. The rock is often covered in a layer of softer mineral, or "cortex" that makes stone identification and flaking more difficult. Next, find a round or oval firm rock for your hammerstone. The hammerstone usually should be baseball to softball size. You can also break off the thick end of a big antler and grind one end round to knock flakes, but that's a lot of work and not as effective as the hammerstone for breaking out some monster blades.



Antler "billet" – either end can be used for flaking. Always grind the business end back round after use.

Nice round hammerstone with signs of usage.

Flint knapping is often an exercise in blood-letting

Grip the core firmly and support your hand on top of your thigh. Since you will probably be naked, put some bark or leather over your thigh so that you don't slice an artery and end your primal adventure prematurely. Lift the hammerstone a foot or more and bring it straight down on the edge of the working stone, smacking it as hard as you can. Look at the flakes. If you don't have any flakes, try again. If you still don't have any flakes, pick a different stone, make sure that your muscles have not atrophied, or use a boulder to

smash the rock with a chimpanzee's flair for improvisation. Just watch out for your toes.

If you have a big flake, you have a knife. If not, use short tapping and grinding strokes on the core to roughen up the edge for another smack. (If you smack a sharp edge, the edge just shatters, so you need the edge to be dull and thick to take off more flakes). Once you have a big enough flake, grind one edge dull on a rough rock so you can hold one side without lacerating yourself anymore than you already have (flintknapping almost inevitably results in lots of small cuts).

Your simple flake will more than suffice for all your slicing needs. Unlike a steel knife, when working with wood it is most effective when pulled towards you like a draw knife. It can also be held in one hand and pushed forward with the thumb of the other. Don't use a flake knife to try and saw through bone or thick wood. If you need to dismember large game, just cut the tendons around the joint, twist the limb out of socket with your brute caveman strength and cut any connecting ligaments. Or just smash off the limb with a big rock.

You can also use it to make long rawhide thongs / lashings. After moistening the rawhide, grip one edge under your foot or between your teeth. Slice through the hide, all the while moving your grip and angling the cut to follow the edge of the hide. You can spiral cut a hide this way to produce thongs hundreds of feet long. Once your flake gets somewhat dull, you can use it to scrape meat and fat off hides. Don't forget to eat the calorie-rich scrapings!

Chopping Logs

Did you make the flake knife? If so, congratulations – you have a big chopper too (unless you chucked the core at a squirrel and it fell in a lake). Actually, it might be that simple (especially if you started with a flatter core) but sometimes it isn't. To deliberately make a chopper, you can either break a larger rock in half with a diagonal break, or continue removing multiple short flakes from one edge of your core. With the second option, you are close to making a hand axe – an elaborate *Homo erectus* triangular device flaked on both sides that we really have no idea what it was used for – maybe to just show off to potential mates that you were the best stone tool maker in the tribe (Kohn & Mithen, 1999).

Hand axe – the pinnacle of Erectus technology.

While choppers will be effective at hacking through ribs and necks, cavemen typically did not chop or saw all the way through trees or limbs. Instead, use your chopper to make a score all the way around the tree, like a beaver (you can also use a bone chisel and club for this). Climb up the tree and lean back (don't try this with huge trees). The tree should creak and start to snap. If it doesn't, make your score a little deeper and try again. To use this method on large limbs that are already down, after scoring, wedge the limb between 2 adjacent trees and push on the far end like a lever till it snaps at the score.

Going Clubbing

This is the archetypal caveman accessory. Any piece of heavy wood that you can grip well will do. It is useful for cracking nuts, skulls and as a hammer for driving stakes into the ground or into cracks in logs to split them. You can get all crazy, search for the perfectly balanced branch and use your handaxe to spend hours chopping it off a tree, or you can just pick one up from the local forest floor when the need arises. Just make sure it's not rotten so the cave hyenas don't laugh at you!

In British Columbia I used a log and some other logs to split . . . a BIG LOG. With one side flat to sit on, it made a great one-log raft / surf board!

Skewering Stuff

The wooden spear is the simple "Lord of the Flies" stabbing implement, usually just jabbed into prey like a lance. Cut down a straight-ish hardwood sapling, as long as you feel comfortable handling. You will need the chopper that you made above. Counter to the lazy intuition of the so called "modern" man, the THICKER end is going to be sharpened. Having the thick end sharp means the business end is much stronger for breaking through ribs and is heavier and better balanced if you do decide to throw it. Hold the sapling with your feet and the thick end pointed at you. You will need a big flake that you made above. Using both hands to hold the flake, draw the flake against the wood and toward you. Repeat 10,000 times or until your tip looks like a vampire-killing spike that is as sharp as a needle. To speed up the process you can either rough out the initial shape with your chopper or smash the

thick end with a boulder and hope that you end up with a giant sharp splinter. I have actually had some success with the boulder method. If you want, you can carve some barbs into your point so that it will dig deeper into the prey. You can also make the tip more knife-shaped than stake-shaped, with one or more wooden cutting edges.

With the spear on the bottom I ran down a feral goat in the Chihuahuan Desert and killed it with a single jab into the heart. The tip broke off about 3 barbs down.

If your spear isn't as straight as you would like it to be, hold the bent section over a fire or if it has bark on it, on some hot coals until it begins to sizzle. Press your feet against the bend and pull with your arms. Eye the curvature, rotate and repeat until straight. If you haven't calloused up your feet yet, you can press the shaft against a large smooth rock or tree trunk. Fire can also be used to burn off extra splinters with the splintering method and to harden the tip if the sapling is fresh.

You could also add a stone flake point secured on with primitive fiberglass (sinew, gut or plant fiber wrapping glued and water-

proofed with tree resin, wax, tar or hide-glue). The multi-flaked Neandertal/Early *Homo sapien* Levallois blade may have been used for this, but it's more work to make and then you might only get one chance at a killing jab with your spear. Stone tips shatter very easily -- the upside being that there's now a bunch of razor sharp shrapnel in your cave bear, downside -- you no longer have a weapon and the cave bear is pissed off.

A few of my Levallois blade / Mousterian points, which were the most advanced tools known to have been use by the Neandertals. To make one, flake all the way around the core to create a tear-drop shape, then knock off a huge flake running all the way to the point of the tear-drop. While not symmetrical, unifacial Mousterian points are razor sharp -- much sharper than the later more "advanced" bifaces.

Snagging Rats

This is an amazingly simple but often overlooked tool. For a rodent skewer, you want your tool to be thin enough to fit into a rodent's burrow and flexible enough to bend around any turns. Find a sapling or branch with a y in it. Use the tree-chopping techniques described in the previous pages to cut the sapling half an inch or so *below* the y. Round off this cut with your flake or an abrading rock. Next, cut off one of the branches of the y a few inches *above* the y. Sharpen the tip with your flake knife and/or an abrasive rock. It helps if you curve the tip inwards so it doesn't catch on the burrow walls when you pull it out.

If you want, you can reinforce the barb with some rawhide thong or sinew lashing. To skewer a rodent, simply insert the stick into a

burrow. When you feel something on the other end, jab it in a little further, give it a jerk and twist as you pull it out. Make sure to have a club or rock ready to finish him off.

To make a fishing gaff, simply make a scaled-up version of the rodent skewer but with more stiffness. You can use your rawhide thong and some tree sap to lash on your bone awl to make an extra effective gaff.

Quest for Fire

We know that the Erectus and Neandertal used fire, at least occasionally (Wrangham, 2009). We don't know if they could make fire. Making even the most primitive fire involves performing a huge number of steps in precisely the correct fashion and order. If our early ancestors did not have language to compress this information (and it's certain they didn't have it at some point) they would have been unlikely to produce fire. However, they likely encountered natural lightning-sparked grass and forest fires and learned to associate them with food, warmth and light. As they scavenged the blackened carcasses left in the smoldering ashes, at some point someone discovered that a glowing twig and some dry

grass could start a new fire, and that it could be fed organic material and kept alive for weeks or months.

If the Erectus or Neandertal could make fire, they likely used either the “simple” hand drill or fire saw. I am highly experienced with the hand-drill and have started thousands of fires in all conditions with it. I have found that the fire saw requires far more physical effort and tolerates less leeway in material selection.

Rubbing Sticks

To make a fire by hand-drill you will need only 3 items: a spindle, hearth board and tinder. Ideally, the spindle and board should be made from the same kind of wood – light and soft but firm – avoid any wood that is damp, hard, resinous or rotten. If it is not possible to make both parts from the same kind of wood, the spindle should be slightly softer – if it is too hard, you will drill right through the hearth board before any embers are produced.

The ideal spindle should be about as big around as your little finger, 2 to 3 feet long, as straight as possible and free of bumps but not too smooth. As with the spear, the thicker end is going to be the

business end. Use your flake knife to lightly shave off any bark and flatten any nodes or scars.

You want the business end to be perfectly flat with a sharp outer rim – this concentrates all the pressure on outer edge where the speed is the greatest, producing lots of friction and heat. Grip the spindle right next to the thick end and rub it on a flat rough rock using a circular motion. Using your flake, lightly pare down the sides so that it looks like the picture. The spindle is ready.

To make the hearth board, carefully tap a flake or flat piece of bone into the end to split off at least 3 sides of a piece of wood, leaving a board shape about as thick as your thumb. You don't want the board so thin that you don't have enough drilling space to make an ember or so thick that the dust pile is too far from the heat of the spindle. Now, use a dull flake to create a depression on one end of the board with a screwing back and forth motion. You don't want to start in the middle of the board because it can easily break when you go to make the next hole. Give your spindle a couple of spins in the depression to round it out and make it just deep enough so the spindle won't jump out. Re-flatten and shave the end of the spindle.

Cut a sharp v-shaped notch in the side of the board all the way to the center of the depression. Score one side of the v with your flake, then score the other side and shave a flake towards the other score. This is called a "stopper cut" in woodworking and enables you to remove shavings with control. The notch should look like a v from the top and an upside-down v from the side. The shape and depth

of the notch is paramount unless you are in an extremely dry environment, in which case it is sometimes possible to get an ember that forms in a ring of dust around the depression with no notch at all. The sharp notch allows oxygen into the depression and pinches the dust produced which will turn into the ember.

Next gather some very dry material for your tinder. Some kinds of bark work well, as does very dry grass. Whatever you use, it must be twisted, shredded, torn and rolled between your hands or on a rough rock until it is very fine. It then must be firmly compacted into the shape of a bird nest the size of a softball or larger. Adding a pinch or two of some super fluffy material like cattail down to the center will help grow any tiny embers.

Now you are ready. If you can con another caveman into helping you, face each other and take turns on the spindle as each nears the board. Just make sure that the transfer is fast so that there is little time for the dust to cool off. Place a leaf or piece of bark under the notch to catch the ember. If it is really windy, you can dig a shallow depression and place the tinder bundle into the depression with the board on top. Squat down and place one foot on the board to steady it. Spit in your hands and rub them together. Place the spindle in the board depression. Starting at the top, hold your palms flat or arched out and press firmly into the spindle. Lean forward with your weight and start moving your hands quickly back and forth. You will soon find that your hands are nearing the board! Stop. As

quickly as possible use one hand to steady the spindle while the other moves to the top. Repeat the spinning motion, and give it everything you have. You should see a pile of dark brown dust forming in the notch and smoke coming from the hole. Keep going hard until smoke comes from the pile of dust in the notch. Carefully fan the dust (don't blow on it!) until you see a red glow.

Use a small twig to release the ember from the notch. Transfer the ember to the center of the tinder bundle. Fold the bundle over the ember, cradle it between your hands and blow into it with long steady breaths. It helps to face downwind so that the wind assists and blows the smoke away from your face. When you have flames, set the bundle down and add twigs and kindling. Quickly hide your fire kit before your fellow elated cavemen use it to stoke the fire.

If you don't have an ember in less than a minute, something is seriously wrong. If you hear squeaking, the depression is too deep, the spindle end is round, or sweat or moisture has dripped into the depression. Make sure the depression is dry or make a new depression and notch. Try shaving the sides of the business end of the spindle so they do not contact the depression. Also make sure that the end is flat, flat, FLAT! If you don't hear squeaking and no dust forms, try using more force. If there is still no dust, throw your kit into the kindling pile and look for some better wood.

Your hands will probably get blisters like this, especially if something is seriously wrong with your fire set.

Fire in the Bank

Once you have a fire going, you want to keep it going as long as possible so you don't have to exert so much energy to make another one. If you must leave your fire unattended, you can "bank" it by putting in some sizable hardwood chunks a few hours beforehand, and then covering your entire bed of coals with a thin layer of ash or dirt, which is just permeable enough to let in enough oxygen to keep the embers glowing for up to several days.

While many survivalists today build elaborate contraptions to transport their fires, some Australian aboriginal people had a simpler solution – carrying a flaming hardwood log to the next camp and keeping it that way by igniting clumps of spinifex grass along the walk (which also served to signal fellow hunters: "We're heading this way!") (Dunlop, 1967). If it is too wet to use that method, you can always transport your ember by rolling a giant cigar and puffing it along the way.

Shell and All

While many people today imagine that cavemen cooked their kills on spits, racks or skewers over the fire, these are very inefficient and wasteful ways of cooking. The food must be constantly monitored and a lot of fat is lost as it melts, drips into the fire and burns up. Cavemen likely enjoyed eating delicious juicy raw meat and initially cooked food only when it was tough. Meat from big game was likely eaten raw, with the rest spiral-sliced into long thin strips and dried in the sun for the future (Sørensen, 2009). Fat would likely have been cut away and "rendered" or melted into balls and blocks for storage. One of the most common methods of cooking small and medium game among recent hunter-gatherers was to singe off the fur/feathers/quills in hot flames and then bury the whole animal under coals or on top of super-heated rocks in shallow pits covered with green leaves and dirt (Black & Thorns, 2014). The skin protected the meat from burning and sealed in the precious fat and juices. If the animal was left to steam overnight with hot rocks, even the toughest meat would fall off the bone. When buried in coals however, the animal is often removed after only a brief time while still quite rare and bloody – the cooking serving only to make the carcass easier to dismember and distribute (Dunlop, 1967).

Steamy Pits

Pit cooking with hot rocks and steam can not only make the toughest meat tender, it will also do the same for many plant hearts and tubers while at the same time making them sweeter and more palatable by breaking down complex starches and degrading some toxins (Black & Thorns, 2014). To build a simple cooking pit,

excavate a depression with your digging stick. It can be shallow, but you will need to have enough loose dirt to cover it with a layer about a foot thick for good insulation. Fill the depression with several hundred pounds of kindling (no big logs – you want this fire to burn fast and hot). Stack a bunch of rocks on top so that there are enough rocks to cover the bottom of the pit. The rocks go on top of the pile because heat rises. The rocks should be between the size of your foot and the size of your head. Avoid wet rocks and experiment with rocks beforehand to make sure that they will not explode when super-heated. Light the fire and allow all the kindling to burn away.

Gather a few armfuls of green edible plant matter while the fire burns down. The rocks turn black as they are covered with soot, then white as they get so hot that they burn the soot off. When they

are white (or glowing dull red at night), they are ready. Use a long wood branch to push the rocks into a flattish cooking surface. Toss on an armful of leaves. Toss in the dinner. Toss on another armful of leaves. Cover everything in a foot of dirt and make sure there are no hot spots. Hit the sack. Wake up. Feast on the tenderest meat you've ever had.

If you are caught out in the open in the cold with no shelter, you can dig a shallow depression the size of your body, make the super-heated rocks as described above, cover them with a few inches of dirt, and sleep on top of a heater that will stay hot well into the next day.

Preparing to pull oysters and crabs out of a shallow pit of coals on the beach with my brother Isaac.

Splintering Bones

A bone awl can be used either as a leather punch or as a last-resort extreme close-quarters dagger and for defense and finishing off large game by stabbing repeatedly in the heart or neck. Find a leg bone. Smash it. Hope for the best. Actually, more gentle strikes will result in a longer bone splinter. Begin at one end by knocking off a joint and tap your way down. You want the splinter attached to one joint so that you can hold it in your palm and apply more pressure when stabbing. Fresh bone will give longer splinters, but they may have some spiral to them. Smooth, sharpen and shape the splinter by rubbing it aggressively on rough bed rock or on a rough boulder.

Digging It

In the books on contemporary foraging societies, the digging stick (and foraging in general) is often considered the domain of women and is also used by the women as a club for small game. However based on the archaeological evidence, like chimpanzees, our earliest ancestors likely had no *strict* gender-based roles or *exclusive* division of hunting and gathering activities (Estalrrich & Rosas, 2015) (Wynn & Coolidge, 2011).

This is your shovel for digging water holes, tubers, possums, and anything else you may need to dig up. Use the same technique as for making the spear, but make it 3 to 4 feet long and either shave the thick end to a duller point, or make it flat and chisel shaped. Harden the tip with fire if it needs it. To dig with the stick, grip it with one hand close to the business end and with the other near the middle or top. Slam it down into the ground and push or pull with your upper hand to create a lever action and loosen the soil. Remove the dirt with your hands. You can also remove dirt with one hand while you loosen with a heavy digging stick in the other.

Penguin Style

Being furless is a major disadvantage in any kind of cold or wet climate. We must have spent a *really* long time running down big game on the African savanna to evolve to be hairless (Liebenberg, 2006). The only benefit being hairless has is that it allows the body to keep cool in the hottest environments – but only if that environment is dry. This means that by the time our ancestors moved into colder regions, they must have already mastered a way to stay warm; otherwise they wouldn't have survived the night (Gilligan, 2010). We know that cavemen lived in caves (or more often, shallow rock shelters).

But did they build any kind of shelters and how did they stay warm? Fire is an obvious choice to modern man, but if you have ever tried maintaining a roaring fire all night in a rock shelter in freezing conditions, you know you would need to gather a huge amount of wood and don't get much sleep. While hunters like the

Inuit in recent times used small oil lamps to illuminate their dark igloos and underground shelters during the long winter night, they kept warm by sleeping naked together under mounds of furs in elevated spots (heat rises, cold sinks) (Stefansson, 1913). Massive huddles and body heat alone allow penguins to survive the otherworldly freezing hurricane strength winds of Antarctica. Even when using a sleeping bag, on the coldest nights, I remove most of my clothing and stuff it inside my bag. This provides insulation while at the same time allowing body heat to circulate around and keep extremities from freezing.

Looking up into my igloo in the Upper Peninsula. The sleeping area is elevated to trap heat and covered with lots of hay for insulation.

A Nest for Rest

If you have ever observed a dog, they often go through a ritual before bedtime – scratching at the ground and walking around in circles before curling up. Outdoors, this would result in a nice round nest-shaped depression with softened dirt – a quick, cool soft bed and wind-break. Chimpanzees and orangutans weave together actual nests from living branch tips high in the trees and line them with soft leaves or bark (Fruth, Tagg, & Stewart, 2018; Goodall, 1986).

Ground-dwelling gorillas also preserve this nest-building instinct – mashing the vegetation in a circle and maybe dragging in some foliage to weave into a rudimentary nest wall and padding (Fossey, 1983). I have built and slept in nests in trees using the chimpanzee weaving technique, but sometimes you are in an area with trees that don't have pliable branches. In this case, you can drag a bunch of stiff branches or saplings up the tree and wedge them together to create a hard flat sleeping platform, on top of which you can build your nest.

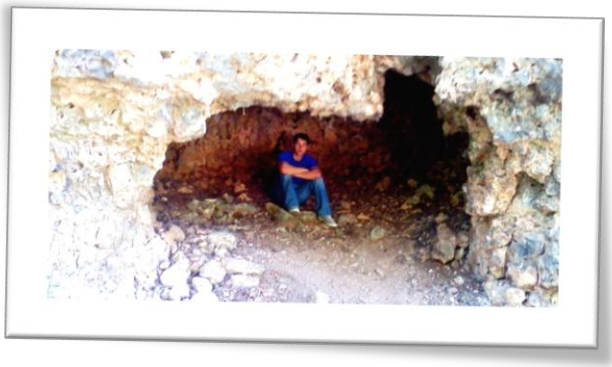
Why build a “nest”? If you have ever tried covering yourself with leaves, shredded bark or even a pile of small animal hides, you know that the first time you toss and turn, all the bedding just falls off. However, if you are in a hole, whether dug in the ground or a basket-like nest, the “blanket” will stay put a lot better. Squirrels are the undisputed masters of building nests for warmth – their spherical twig “dreys” are covered with leaf thatching and completely lined inside with progressively softer materials – a shelter and bed all in one that traps body heat extremely well (Bosch & Lurz, 2013).

With a gaping opening at the highest point that lets out heat, forget the diagrams and photos of modern lean-to type “debris huts” and go with a nest – you’ll sleep much more soundly.

Hibernation?

Completely enclosed nests as well as the dens of bears and other hibernators may serve another function as well. While they are permeable enough to let in oxygen, they also are enclosed enough to trap small amounts of hydrogen sulfide and other gasses naturally emitted by the body, which trigger deep sleep and lowering of metabolism and body temperature (Revsbech, Shen, & Chakravarti, 2014).

In extremely cold weather, I sleep with me head under my bedding. I have found that I fall asleep much faster and sleep more deeply and soundly, which I attribute to elevated carbon dioxide levels. While humans probably are incapable of true hibernation, several hikers and motorists who were trapped under snow or buried in cars have survived up to a month without even water as their bodies entered a state of near-hibernation (Stone, 2007). Again, this is one of those potentially very dangerous ideas that a "survival expert" would never recommend. Truly sealing yourself in with something like a plastic tarp would definitely not turn out well!



My brother Isaac in a tiny rockshelter – stuffed with grass and covered in snow this would make an epic bear den!

To Bed in a Basket

It is possible to build an extremely strong, totally waterproof shelter in the open without even using lashings. Flexible branches and saplings are ideal, but even stiff branches can be wedged and interlocked in such a way to form strong basket-like structures and frameworks. You want the sides of your shelter to be as steep as possible so that water will run off quickly and not pool and drip. Find a flat, elevated spot well away from water and thick vegetation (you probably don't want tiny critters feasting on you while you try to sleep). If it is cold, make your shelter as small as possible so that the body heat of your tribe can warm it adequately.

Begin by pushing sturdy saplings into the ground in a circle about a foot or two apart, bend them over and interlock the tips. If the ground is too hard or rocky, wedge them against a circle of logs or heavy rocks (Seymour, 2009). Next, weave flexible branches in horizontally to form rings spaced about a foot apart. Remember, over, under, over, under, but don't worry about skipping sometimes if it looks like something doesn't fit well or will break. If all you have is stiff branches, instead of weaving horizontally,

weave diagonally from the ground up (less extreme bending required).

Once you have a basic framework, weave smaller branches in totally randomly to add tremendous strength to the shelter and provide lots of points to weave in the thatching.

My friend Uriah building a framework with stiff branches. Even though he's using twine lashing, note the shape of the structure and steep incline of the sides.

Inside my basket shelter. Note the interlocking branches on the left.

Next, gather your thatching. Unless you are in an area with giant broad leaves, you are going to need many armfuls of thatching. If you do have broad leaves, you can split the stem upwards part way and hang the leaf on the framework like a clothespin. The longer the thatching material is, the more easily it can be secured. Always start thatching next to the ground first so that the layers overlap like shingles.

If you use boughs for thatching, you can just weave the stems into the framework, but will need to make the framework very steep and layers extremely thick. If you use grass, reeds or strips of soft bark, lay a handful against the framework and use a small flexible twig to pin it in place by tucking the ends of the twig into the framework. Once you have the first twig in place, the next twig can be pinned under the first twig if need be. If you have flexible vines or long fibrous leaves or roots, you can use these to tie the bundles in place. If the thatching is both long and flexible, it can be fed through the framework and doubled over on itself.

Uriah's finished shelter. The thatching is thick, but there is a section missing in the lower left – oops! Nice rock anchors though!

Whatever thatching material you use, there should be plenty of overlap so that the water will shed. When you get to the very top, you can either leave a small smoke hole or bind all the thatching stems into a sharp, steep vertical cone. If you are worried about wind blowing your thatching, you can lean lots of branches against the outside of the shelter.

If you completely thatch your shelter instead of leaving an entrance, your shelter will be incredibly warm. Just build the shelter over a natural depression or dig a depression under one side to enter it. This little tunnel acts as your "cold sink" and can also be easily plugged with leaves. To keep out tiny bugs, you can completely plaster the inside of the framework with thick mud or clay – mix it with vegetation to extend and strengthen it like fiberglass. To make your shelter even warmer, fill the entire interior with dry leaves, pine needles or shredded bark – just make sure no fire is anywhere near it as you are now sleeping soundly in a giant tinder bundle!

Fur Side Down

While the stereotypical caveman has his club and furs, much of the time, particularly in warm climates, our ancestors likely didn't wear a damn thing. Even recent hunter-gatherers, like the aboriginal groups in the Australian Western Desert preferred to burn the fur off their kill and leave the skin on the animal as a pit cooking case and had neither blanket for cold nights nor any kind of clothing (Scholander, 1958). These hardy folks often survived freezing nights by sending their 4 year old kids around camp with torches to set every bush and tree on fire (Dunlop, 1967). However, unless they were covered in fur like Bigfoot (unlikely) there is no way that Neandertals and Heidelbergs could have survived the extreme cold of ice-age Europe without fur coverings.

Once you have a skin off an animal, stake the skin taut fur-side down onto the ground with sharp sticks or bones. You can also just drape it over a smooth log and pin it in place with your chest. Use a dull flake to scrape and start lifting the edge of attached fat or muscle up. Once you have an edge, grip the flesh with your fingers or teeth and pull it off. Continue until the hide is all white with no

flesh attached. You can also allow the skin to dry before scraping, but if the flesh is fatty, the hair might fall out. Allow the skin to dry. Once it is dry, the stakes can be removed and the hide can be stored in a dry place or used as-is for stiff bedding.

Tan Your Hide

We don't know if cavemen could "tan" hides, but it can be softened with simple processes and some backbone (Wales, 2012). Once the skin has dried, rehydrate it by plastering it with spit or urine and allow it to sit until pliable (you do still want to be a caveman, right?). Find 1 or more other cavemen to help you. Grip the edges of the hide with both hands and have your partner(s) do the same.

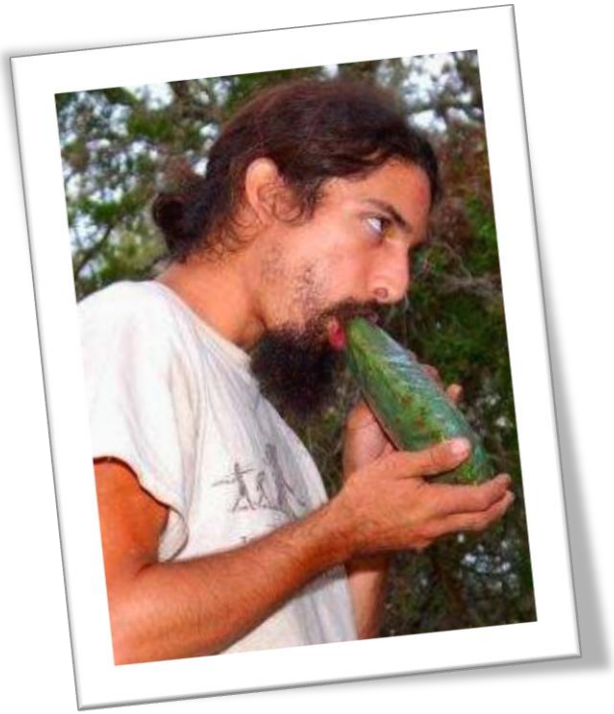
Lean back. Move your hands along the edge and repeat. Continue pulling the hide back and forth in all directions until the skin is dry and no longer cool to the touch. This will take several hours, and when you are done, the skin will be soft, lofty and super flexible like tanned leather. The urine or spit contain acid and enzymes that help break apart the mucousy "hide-glue." The brain from the animal can accomplish the same effect, but like most cavemen, you will probably want to eat that fat-loaded delicacy. Pulling the hide as it dried pulled apart the fibers that make up the skin, creating trillions of air pockets.

The left side of this skin has been "broken" dry and pulled soft. The right side is still rawhide and as stiff as cardboard.

The skin is ready to wear. In extremely cold weather, the fur side should be kept against the body to trap more air and warmth. However, wearing the leather side against the body for several weeks or more will impregnate the leather with oil from your skin, making the fur more supple and resistant to water. If the hide gets wet, at least parts of it will become stiff again upon drying. The stiff parts can be re-softened by chewing and pulling again. Forcing smoke through the leather side of the hide will make it super water proof, but there is no evidence that our early ancestors did this. The

hide would need to be sewn to form an airtight tube, and no sewing needles appear in the archaeological record until the rather late arrival of *Homo sapiens* (Collard, Tarle, & Sandgathe, 2016). Just hanging the skin leather side down over a low smoky fire for a day or so helps, but the smoke does not deeply penetrate the hide.

The Bare Necessities



Inflating a hollowed-out cactus to carry water

The Watering Hole

We can safely assume that cavemen did not treat their water in any way. This is going to go against every survival expert alive today, but then again, the aim is not to survive to get back to civilization, but to become a wild animal and be able to live like one indefinitely – which is not going to happen if you burn up all your calories trying to boil water every day. In fact, at least one of the more controversial wilderness living schools requires all participants in a year long program to drink untreated lake water, slowly acclimating their bodies by increasing the untreated water

consumption day by day. I have drank untreated water on many wilderness excursions – only once did I contract giardia (by drinking directly from a river) which resolved on its own even though I felt utterly miserable for several days with stomach cramps and severe diarrhea.

Rain is an obvious source of clean water. It will collect on large leaves, in bromeliads, in hollow trees and rock depressions. If there are no natural depressions, improvise a container, such as a coconut, bone, bamboo, bark, hide-lined hole in ground, etc. If you build a triangle-shaped lean-to or even place a bunch of stems into the container fanning up and away, you can increase your catch as the water sheds off the larger surface area and into the container.

The safest way to obtain clean, untreated water is by getting it from a spring, natural seep or by digging a seep well at least a body length or so away from a river or pond, or in a low-lying dry area where lush vegetation indicates water not far below the surface. You can also sometimes get water on the coast like coyotes do, by digging behind the first dune and digging 2 to 4 feet down. Let the water seep in and the sediment settle. You can use a hollow reed or piece of bamboo like a straw to get the water or a large crumpled leaf in the manner that chimpanzees extract water from hollows in trees (Goodall, 1986).

If there is no water at all, the precious liquid must be obtained from other living things – plants parts such as vines, stems, tubers and

fruits sometimes contain copious amounts of water, as does animal blood and tissue. In a state of severe dehydration, don't eat the plant or animal – just mash it, squeeze it, suck out the liquid and spit out the fiber or flesh. Conserve water by resting in the shade as much as possible and only venture out in the very early morning or evening. Immersing your body in colder non-potable mud or water can also help keep you cool and slow down dehydration.

Boiling creek water in a rock shelter in New Mexico – tedious and time consuming. Later on we found some seeps coming straight out of the mountainside and only set up the boiling pot for rabbit stew.

Dinner Time, Boys!

Hold the green vegetables. Unlike other apes, our digestive systems lack the ability to crack the cellulose or "fiber" in plants. So, while a 300 pound gorilla can get all the calories he needs by munching on armfuls of celery stalks all day, you can't (Milton, 2003). With our huge brains burning through calories even at rest and all the heat lost by our hairless bodies at night, we need calories – lots of them, so must focus on getting as much fat, sugar and starch as possible, in that order. When introduced to modern cuisine, a Huaorani hunter could not fathom why any humans would choose to eat a bowl of leaves when they had such amazing dishes like pizza and ice cream (Kane, 1995)! Gold to the caveman is animal fat and plant oil. You want to get the most bang for your buck – get the most calories with the least amount of effort.

There is an insane trend today to eat lean meat and throw out the best parts – innards, gizzards, livers, kidneys, eyes, tongues, brain, marrow, etc. Cavemen and super predators like killer whales often do the exact opposite -- eating the good stuff and leaving behind much of the meat (Ferguson, Higdon, & Westdal, 2012). It may seem wasteful, but they are instinctively going for the gold and avoiding protein poisoning. Subsisting entirely on rabbit meat is particularly dangerous – you can starve to death eating rabbits all day – unless you only eat the good parts most of the time (Speth, 1983). I can actually taste when I am eating too much lean meat. I just can't stomach any more and crave the taste of brains and eyeballs! One of my favorite foods of all time is *menudo* – chopped beef stomach and intestine stew dripping with so much fat that it solidifies if it is not piping hot!

Don't throw out the innards! Here you can see the liver and kidneys, stomach and intestines. Some primitive peoples even went to the extreme of eating the stomach contents!

Go for the Nuts

Those ice age squirrels are suicidal. MY nuts!

For plant foods, going for the gold means focusing on (in the following order) nuts, seeds, fruits, berries and occasionally fibrous but sugar/starch rich foods like palm heart or sugar cane. You'll need to learn and commit to memory what plant foods in your region are calorie-rich and what time of year they are ripe. You don't need to memorize hundreds of edible plants with marginal nutritional value. Just focus on the high-calorie staples and leave everything else alone. Most of the time, for at least some of our distant ancestors, plant food was likely viewed as a "survival" food – only considered paramount in times of hunger (Richards, Pettitt, & Karavanić, 2000). However, if there was a windfall crop of nuts or large fruits, the focus likely would have shifted from hunting to sitting around gorging on the easy pickings.

Plants also provide important vitamins not always found in meat, especially not in cooked meat (Gadsby, 2004). You need only a tiny amount of these vitamins every day, and usually a handful of greens, shoots and fruits per day more than suffices. If you are in an arctic or coastal area with few plants, a little raw meat also does the trick provided it hasn't been contaminated or infected.

I ate several pounds of Saskatoon berries every day during the summer in Idaho and Montana. Plentiful berries can be a great source of energy boosting sugar and vitamins.

Bugs and Slugs

While protein can provide calories, it is far more important as a vital building block for all of our body functions. You don't need much – around 70 grams is often recommended, but you must get it every day. Without it, your muscles will atrophy, you body will start randomly shutting down and your thoughts will become fuzzy and confused (Khan, Khan, & Jan, 2017). So while you would never want to spend all day chasing mice, small lizards or bugs, without another source of protein, spending an hour or so a day on spent on micro-game or shellfish is acceptable.

A few minutes a day probing with my fingers in lake muck like a raccoon provided plenty of protein in the Lacandon jungle but only a few calories.

Prey	Whole Caloric Value*	Survival Time**
Mouse	40	30 minutes
Wood Rat	400	5 hours
Squirrel	600	7 hours
Rabbit	1,000	12 hours
Porcupine	10,000	5 days
Ibex	50,000	3 weeks
Wild Boar	80,000	1 month
Red Deer	200,000	3 months
Elk	450,000	7 months
Moose	600,000	10 months
Bison	1,000,000	1 year
Wooly Mammoth	6,000,000	6 years

*Estimates based on figures derived from (Dierenfeld, Alcorn, & Jacobsen, 2002). **Amount of time that one hunter can subsist on a single prey animal before starting to lose weight.

Rats, Reptiles and Rabbits

Small game animals like rats, rabbits, squirrels, large lizards and snakes can be caught and killed with clubs, rocks and simple deadfall traps and snares. These are considered excellent sources of protein, but poor sources of calories, as each individual usually contains fewer calories than you need in a day to survive. Procure them if the opportunity arises or if no larger game is available. This is the one category of game you might get lucky with on rock chunkin'-- just don't waste too much time or energy on it!

Skin on or skin off? Which do you think will taste better? The one on the right is a coral snake. The only reason I skinned is was to save the skin for future classes.

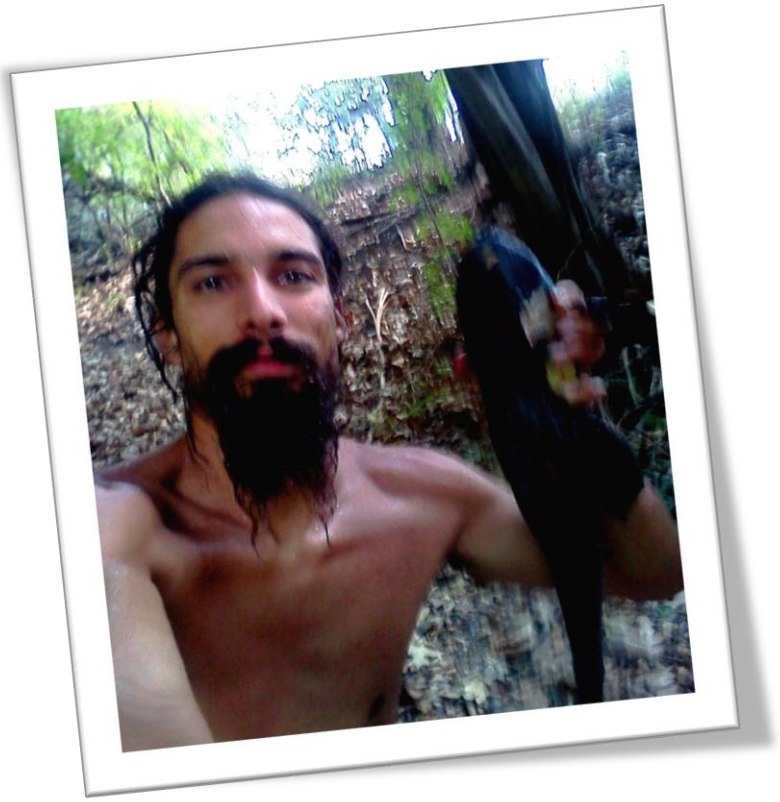
Possums, Porcupines and Pigs

Now we are getting somewhere. Medium size animals usually provide an individual with several days worth of calories. In the case of an adult pig, this could extend to couple of weeks! The simplest way to procure medium size game is to locate an active den and set a snare or smoke the animal out (although in sandy Australia desert, foragers also often dig for hours until they locate the quarry). Once the den fills with smoke and smoke pours from any other entrances, if no animal is forthcoming, then there's probably no one home – time to move on. If you cover a lot of ground in the early morning or evening, chances are you will encounter some slow movers – you can easily take down a possum, hedgehog or porcupine with a rock. Wild boars though are dangerous – best to have your spear and some backup.

This porcupine won the lottery and lived to stumble through another day. The other ones weren't so lucky. Porcupines have poor vision and suffer from over-confidence due to having few predators.

Teach a Bear to Fish…

Fish are in a category all their own. At times even cave bears stop dreaming of mammoth carcasses and go fishing. Some species are just way too easy to catch – there is actually an Aquatic Ape hypothesis that holds that we became hairless because we spent so much time in the water diving for shellfish and grabbing catfish (doesn't explain the sweating ability though or lots of other human quirks) (Hardy, 1960).



I dove underwater, stuck my hand in a hole and pulled out dinner -- like pulling rabbits out of hats. Ok, maybe a little more dangerous.

Forget rods, reels and bass (have you ever eaten a bass – they don't rank anywhere near the top of delicious fish in my book). Early modern humans in Eurasia likely fished with gill nets, seines and harpoons (Zhilin, 2014), but our earliest ancestors (as always) likely preferred simpler brute-force techniques. Any fish that lives in a hole is a good target – think noodling for monster cats – sticking your arm down a dark hole, into a fish's mouth and pulling that 50 lb sucker out.

Like bears, cavemen also would have shown up for fish runs and spawns, when fish migrate upstream en masse, leaping right into their predator's mouths (sometimes literally). To target spawning fish the Neandertals could have used gaffs, multi-pronged gigs, or simply stunned them with clubs or grabbed them by hand. To "tickle" a fish, slooooooooowly move your hand towards a fish as you close your fingers. Let him become comfortable …… then …. GRAB'EM! To concentrate spawning fish, you can easily construct a stone fish weir – just pile up rocks to make a set of walls that funnel the fish to your waiting kids who can throw them on shore and snack on the eyballs (Brown, 1967). Again, the real prizes are fish eyeballs and roe – CAVIAR!

Big Game – Big Reward

While small to medium-sized game is often the focus of surviving hunter-gatherers and modern subsistence hunters in marginal environments (Garvey, 2013), many of our early ancestors focused almost exclusively on scavenging and hunting big game like deer, bison, wildbeast, zebra, camel, ground sloth and mammoth (Richards, Pettitt, & Karavanić, 2000). Big game hunting is a huge risk – you might score enough calories for a year or you might die. It was a risk our ancestors were willing to take and they had the

healed bodies to prove it. Many Neandertal skeletons show the same healed fracture patterns of modern rodeo cowboys (Berger, 1995).

Mouth watering. This ain't from no wabbits – when you have pounds of meat hanging out to dry, ya know the good time's a'comin'!

Run'em Down

A lot of would-be cavemen today can be seen sprinting after big game full-speed with a spear. Needless to say, they are always unsuccessful. However, it is highly unlikely that our ancestors ever

hunted big game this way. The few surviving persistence hunters, like the San and Tarahumara, do run down large game, but use very specific tactics. They are only able to run down game during the heat of the day, when a human can cool off by sweating but the animal cannot. The animal overheats and can run no longer after many, many hours, at which point the hunter can walk right up to the animal and thrust his spear into it. In addition, the hunters often take turns running, like in a relay, with the reserve hunters tracking the lead runner at a brisk walk (Liebenberg, 2006). Given that to this day even those whose ancestors lived in cold climates for millennia lack fur and can sweat profusely, this hunting method must have been one of the dominant form of subsistence throughout the prehistory of *Homo sapiens*. However, living mostly in cold climates with their stocky bodies and short limbs, the Neandertals must have used a very different strategy (Dusseldorp, 2008).

Lion-Man

The Neandertals probably hunted like lions – working as cohesive groups to silently stalk and ambush their prey – killing them in epic close-quarters battles or driving them over cliffs. To find prey, they must have been able to imagine where the prey would be and how they would behave. They must have been experts at reading tracks and anticipating each other's movements to a degree that we might regard as supernatural (Liebenberg, 1995). It is possible that the genes that led to the evolution of language originally evolved not for the symbols of language, but to enable the interpretation of tracks and animal signs. Even though the Neandertals had the anatomy to produce speech and possibly the brain structure to understand language, they may have been using their brain structure entirely for intuitive hunting. If they had no language or

had only a very limited repertoire of calls or hand signs, it would explain why their material culture remained almost unchanged for hundreds of thousands of years. It would also explain why captive chimps and gorillas can learn hundreds or thousands of words in human communication systems but have developed no such complex systems in the wild – they are using those mental powers for something else – intuitive pattern recognition and prediction (Reeser, 2011).

After tracking a herd of wild sheep for hours, my friends Josiah and Uriah helped me to drive one into a steep canyon, finish him off and carry the huge slabs of meat 3 miles back to camp in over 100 degrees.

A Family that Preys Together . . .

Unlike contemporary foragers, evidence indicates that Neandertal families hunted big game together (Kuhn & Stiner, 2006). The women and kids did not hang out at the cave scrounging for berries and gathering firewood. From the youngest to the oldest, they were natural born hunters. Women and children likely provided the much needed "man" power to encircle prey and drive them off cliffs or towards other hunters lying in ambush. Instead of lugging carcasses back to the cave, they likely gorged themselves on the spot of the kill for days and dried the leftovers for lighter transport.

Perhaps the most important cavemen tool of all is the family or clan. Alone we are weak against packs of cave lions and dire wolves – but together, STRONG! Neandertals lived in small groups – bigger than modern nuclear families but still much smaller than the tribes of Neolithic farmers or even the Cro-Magnon (Pääbo, 2014). The clan would have been made up of 3 to 10 or so adults and their children.

We don't know for sure if they were patrilocal (sons stay with their parents like chimpanzees) or matrilocal (daughters stay with their parents like lions) or even if they left permanently their families to find mates. However, it's fairly safe to say that almost all the members of a caveman clan were very close relatives – maybe a band of brothers along with Uncle Grock, the old man, cousin Ala, a few unrelated women and an assortment of crumb-snatchers. They probably viewed any strangers with extreme suspicion and perhaps even as prey (Wynn & Coolidge, 2011) (Defleur, 1999).

Within the clan however, they were probably a jovial raucous bunch. They spent every day together since birth and could tell

what the others were thinking without saying a word. They were like a military unit thinking and acting as one, deadly serious in the hunt but reveling in slapstick comedy and ribald humor when their bellies were full.

Now get off your rear.

Round up the relatives.

And go rustle up some hearty grub!

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